इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 13399 (1992): Animal Feeds and Feeding Stuffs - Determination of Urea [FAD 5: Livestock Feeds, Equipment and Systems]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

REAFFIRMED 2002

IS 13399 : 1992

भारतीय मानक

पशु आहार तथा भरण सामग्री — यूरिया अंश ज्ञात करना

Indian Standard

ANIMAL FEEDS AND FEEDING STUFFS — DETERMINATION OF UREA

UDC 636·085 : 543 [547·495·2]

© BIS 1992

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

May 1992

Price Group 1

Livestock Feeds Sectional Committee, FAD 5

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Livestock Feeds Sectional Committee had been approved by the Food and Agriculture Division Council.

The importance of adoption of standard and uniform methods of analysis for quality control needs no emphasis. Such methods not only help reducing divergence in the analytical results but also ensure and enable a proper comparison and correct interpretation of test results.

IS 7874 Methods of test for animal feeds and feeding stuffs is available in three parts:

Part 1 General methods
Part 2 Minerals and trace elements
Part 3 Microbiological methods

This Indian Standard prescribes a method for estimation of urea content in animal feeds and feeding stuffs. It is based on the ISO Draft International Standard ISO/DIS 6654 Animal feeding stuffs — Determination of urea content of animal feeding stuffs and is technically equivalent to it.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*).'

AMENDMENT NO. 1 JANUARY 1993
TO
IS 13399 : 1992 ANIMAL FEEDS AND FEEDING STUFFS — DETERMINATION OF UREA

(*Clause* 4, *line* 5) — Substitute ' (4-DMAB)' *for* '(r-DMAB)'.

(*Clause* 8.1, *Note* 2) — Substitute 'For' *for* 'Fow'.

(FAD 5)

Reprography Unit, BIS, New Delhi, India

Indian Standard

ANIMAL FEEDS AND FEEDING STUFFS — DETERMINATION OF UREA

1 SCOPE

This Indian Standard specifies a spectrometric method for the determination of the urea content of animal feeding stuffs.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
460 (Part 1) : 1985	Specification for test sieves : Part 1 Wire cloth test sieves
1070 : 1977	Specification for water for general laboratory use (*second revision*)

3 TERMINOLOGY

For the purpose of this standard, urea content is the mass fraction of substances determined using the procedure specified in this standard. It is expressed as a percentage by mass.

4 PRINCIPLE

Suspension of water of the test portion in the presence of a decolorant. Addition of Carrez I and Carrez II solutions. Stirring of the suspension, then filtration. Addition to the filtrate of 4-dimethyl-amino-benzaldehyde (r-DMAB) and spectrometric measurement at 420 nm of the absorbance of the solution thus obtained.

5 REAGENTS

All reagents shall be of AR grade. The water used shall be distilled water (*see* IS 1070 : 1977).

5.1 Active carbon

Which does not absorb urea.

5.2 4-Dimethyl-Amino-Benzaldehyde (4-DMAB)

Dissolve 1·6 g of 4-DMAB in 100 ml of 96 percent (*v/v*) ethanol, add 10 ml of concentrated hydrochloric acid (P_{20}= 1·19 g/ml) and mix.

This solution may be stored for a maximum of 2 weeks.

5.3 Carrez I Solution

Dissolve in water 24 g of zinc acetate dihydrate $[Zn(CH_3COO)_2 2H_2O]$ and 3 g of glacial acetic acid. Make up to 100 ml with water and mix.

5.4 Carrez II Solution

Dissolve in water 10·6 g of potassium hexacyno-ferrate (II) trihydrate (potassium ferrocyanide trihydrate) $[K_4[Fe(CN)_6] 3H_2O]$. Make up to 100 ml with water and mix.

5.5 Urea

Standard solution corresponding to 1 g of urea per litre.

6 APPARATUS

6.1 Rotary Shaker — Capable of being operated at 35-40 rotations/min.

6.2 Spectrometer — Suitable for measuring absorbance at a wavelength of 420 nm, and equipped with cells of optical pathlength 10 mm.

6.3 Test Tubes — 160 mm × 16 mm, fitted with ground glass stoppers.

6.4 Volumetric Flasks — 100 ml and 500 ml capacities.

6.5 Water-bath — Capable of being controlled at 20°C.

6.6 Filter Paper — Whatman No. 41.

7 PREPARATION OF THE TEST SAMPLE

Grind about 100 g of the sample so that it passes though 100 mm IS sieve [*see* IS 460 (Part 1) : 1985]. Transfer this prepared sample to a well stoppered glass bottle.

8 PROCEDURE

8.1 Test Portion

Weigh, to the nearest 1 mg, about 2 g of the test sample (*see* 7).

NOTES

1 For urea contents greater than 3 percent (m/m), reduce the test portion to 1 g or dilute the test solution (see 8.2) so that it does not exceed a concentration of 50 mg of urea per 500 ml.

2 Fow low urea contents, the test portion may be increased provided that the filtrate remains clear and colourless,

8.2 Preparation of the Test Solution

8.2.1 Transfer the test portion (8.1) together with 1 g of the active carbon (5.1) into a 500 ml volumetric flask (6.4). Add 400 ml of water, 5 ml of the Carrez I solution (5.3) and 5 ml of the Carrez II solution (5.4). Mix for 30 min in a rotary shaker (6.1). Make up to the mark with water homogenize and filter (6.6). If the filtrate is coloured, increase the quantity of active carbon.

8.3 Colour Development

Transfer, by means of a pipette, 5 ml of the clear colourless filtrate (8.2.1) into a test tube (6.3) and add, by means of a pipette, 5 ml of the 4-DMAB solution (5.2).

Mix and leave to stand for 15 min in a water-bath (6.5) controlled at 20°C.

8.4 Blank Test

Carryout a blank test in parallel with the determination using the same procedure and the same quantities of all reagents, but omitting the test portion.

8.5 Preparation of the Calibration Graph

8.5.1 Pipette into a series of five 100 ml volumetric flasks (6.4), 10 ml, 20 ml, 40 ml, 50 ml, and 80 ml of the urea standard solution (5.5). Make each flask up to the mark with water. One millilitre of the standard solution contains 100 mcg, 200 mcg, 400 mcg, 500 mcg and 800 mcg of urea respectively.

8.5.2 Pipette into a series of five test tubes (6.3) 5 ml of each of these solutions (8.5.1) (one dilution per test tube). Add to each test tube, by means of a pipette, 5 ml of the 4-DMAB solution (5.2) and homogenize. Transfer the solution to spectrometer cells and measure their absorbances at 420 nm, using the spectrometer (6.2) against a compensation solution containing 5 ml of 4-DMAB and 5 ml of water.

8.5.3 Plot the calibration graph, with the absorbance value on the ordinate and the corresponding concentrations of urea, in micrograms per millilitre, on the abscissa.

8.6 Spectrometric Measurement

Transfer the solution obtained in 8.3 to a spectrometer cell and measure its absorbance at 420 nm, using the spectrometer (6.2), against the blank test (8.4).

NOTE — If the sample contains simple nitrogenous compounds, such as amino acids, carry out the measurement of absorbance at a wavelength of 435 nm.

8.7 Number of Determinations

Carry out two determinations on test portions from the same test sample.

9 EXPRESSION OF RESULTS

The urea content, expressed as percentage by mass, of the sample is equal to

$$\frac{c}{20 \times m}$$

where

c = is the urea content, in micrograms per millilitre of the filtrate of the test solution, determined from the calibration graph (8.5.3).

m = is the mass, in grams, of the test portion (8.1).

10 TEST REPORT

The test report shall specify the method used and the result obtained. It shall also mention all operating details not specified in this Standard, or regarded as optional, together with details of any incidents which may have influenced the result.

The test report shall include all information necessary for the complete identification of the sample.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standard

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writting of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designation. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Revision of Indian Standards

Indian Standards are reviewed periodically and revised, when necessary and amendments, if any, are issued from time to time. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition. Comments on this Indian Standard may be sent to BIS giving the following reference:

Doc : No. FAD 5 (90)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75
Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices : Telephone

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002
331 01 31
331 13 75

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola
CALCUTTA 700054
37 84 99, 37 85 61,
37 86 26, 37 85 62

Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036
53 38 43, 53 16 40,
53 23 84

Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113
41 24 42, 41 25 19,
41 23 15, 41 29 16,

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
BOMBAY 400093
632 92 95, 63 27 80,
632 78 92

Branches : AHMADABAD, BANGALORE, BHOPAL, BHUBANESHWAR, COIMBATORE FARIDABAD, GHAZIABAD, GUWAHATI, HYDERABAD, JAIPUR, KANPUR, LUCKNOW, PATNA, THIRUVANANTHAPURAM.

Printed at Printwell Printers, Aligarh, India